# Welcome to Beginner Track!

## Workshop 1: Intro to Machine Learning

Attendance code: **Amazon**
Linktree: bit.ly/btrack-w22-feedback
Discord: bit.ly/ACMdiscord

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# Our Mission

To build and develop a community of students interested in **Artificial Intelligence** at UCLA and beyond.

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# Our Values

- Technical Proficiency and Awareness in Artificial Intelligence

- Creating a Positive Impact on Society

- Diversity and Inclusion

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# ACM AI Initiatives

**Workshops**

**Events**



**Outreach**

**Projects**

# Projects

Get a chance to work on your first deep learning project!

Last quarter, our teams built deep learning models to:

- Classify plant diseases
- Identify humpback whales

Only prerequisite is Advanced Track!

Links: FAQ, Interest form 👉



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# Our Workshops

- **Beginner Track - *What is ML?***
  - Basics of machine learning
  - Implement linear and logistic regression

- **Advanced Track - *Deep Learning***
  - Concepts like deep neural networks, CNNs, RNNs
  - Basic knowledge of ML concepts expected

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# Beginner Track

**Who's it for?**
- no experience in machine learning
- minimal experience coding
- want a solid foundation in the theory behind ML

**What's covered?**
- basics of machine learning
- theory and implementation of simple models
- introduction to useful ML libraries

**When and where are meetings?**
- **Time:** Thursdays 6-8pm (Zoom)

Sudhanshu Agrawal (he/him)

Jenson Choi (he/him)

Claire Huang

Naman Modani (he/him)

# Beginner Track: Schedule

- Workshop 1 (1/13): Intro to ML + Intro to Python
- Workshop 2 (1/20): K-Nearest Neighbours
- Workshop 3 (1/27): Linear Regression
- Workshop 4 (2/3): Logistic Regression
- Workshop 5 (2/10): Multiclass Classification
- Workshop 6 (2/17): Numpy and Pandas
- Workshop 7 (2/24): Guided Project
- Workshop 8 (3/3): Guided Project (continued)

# Don't worry!

- Machine Learning can be daunting!

- We've got you! We'll walk you through all details and try to get you as comfortable with the math and coding sections as possible

# AI and ML in Real Life

# Computer vision
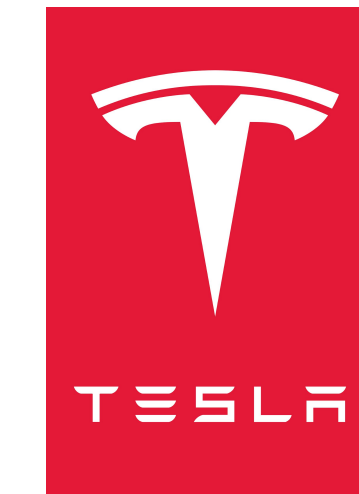
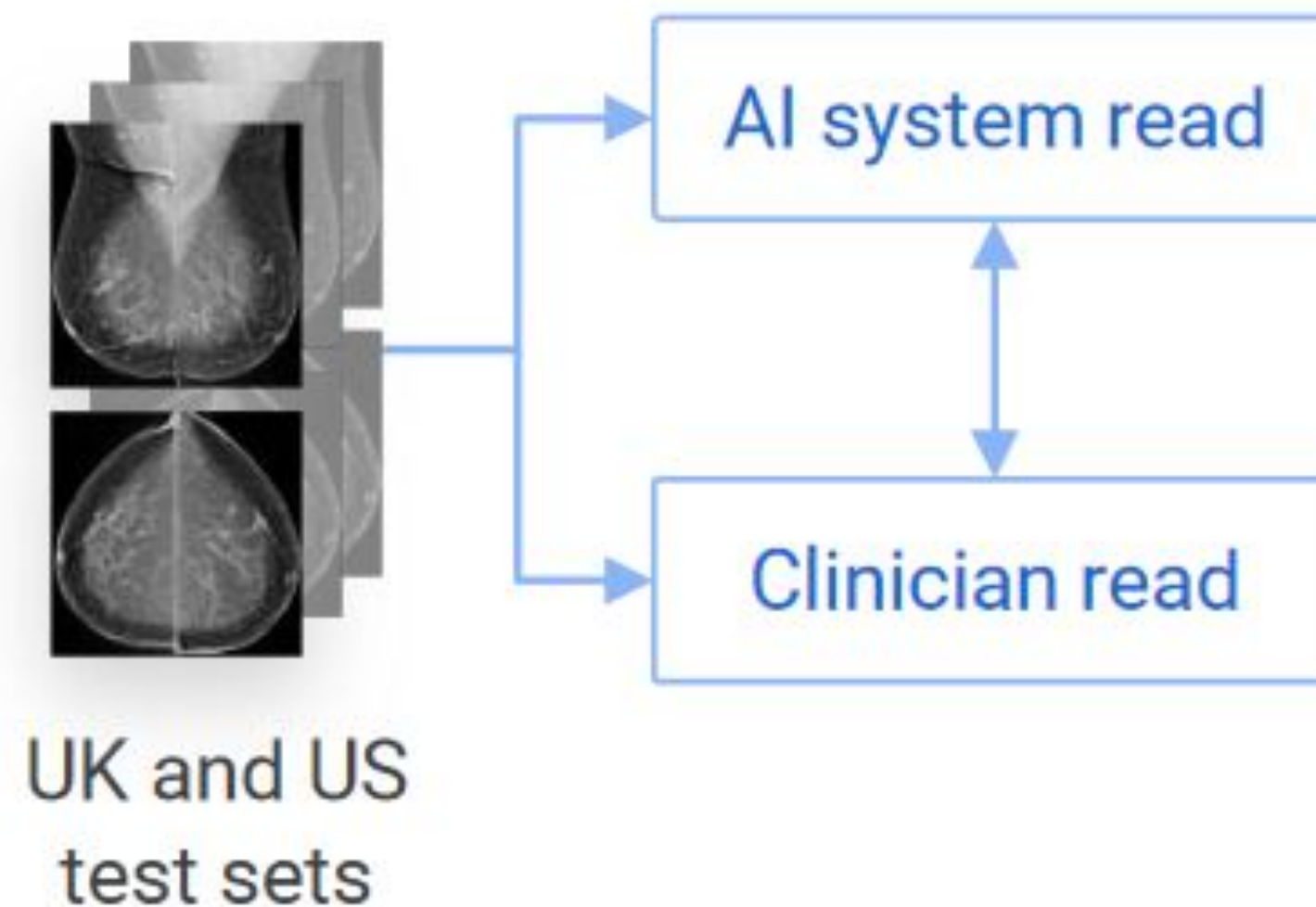

Convolutional neural networks have achieved stunning results in computer vision!

Source: *Taking It to the Streets: Ride in an NVIDIA Self-Driving Car with DRIVE Labs*

# Healthcare



Evaluation

Comparison with retrospective clinical performance

AI system read

Clinician read

UK and US test sets

Deep Learning techniques **outperform** trained specialists in some medical recognition tasks.

Image from: International evaluation of an AI system for breast cancer screening
BBC Article: https://www.bbc.com/news/health-50857759

# Natural language processing



OpenAI, Public domain, via Wikimedia Commons

- https://play.aidungeon.io/
- Built with OpenAI's GPT-3 model
- Type anything you want!

# The Intuition Behind ML

# Let's play a game

# 50-50

- The objective of the game is to find the **letter of the alphabet** such that **50%** of the audience's **names** come *before* this letter, and 50% *after*

- We're going to start off by choosing a random letter

- Each round we must choose one of the 3 options: [The first letter of my name is] Before the current letter, After the current letter, At the current letter

# What is ML?

# AI vs ML vs Deep Learning

AI
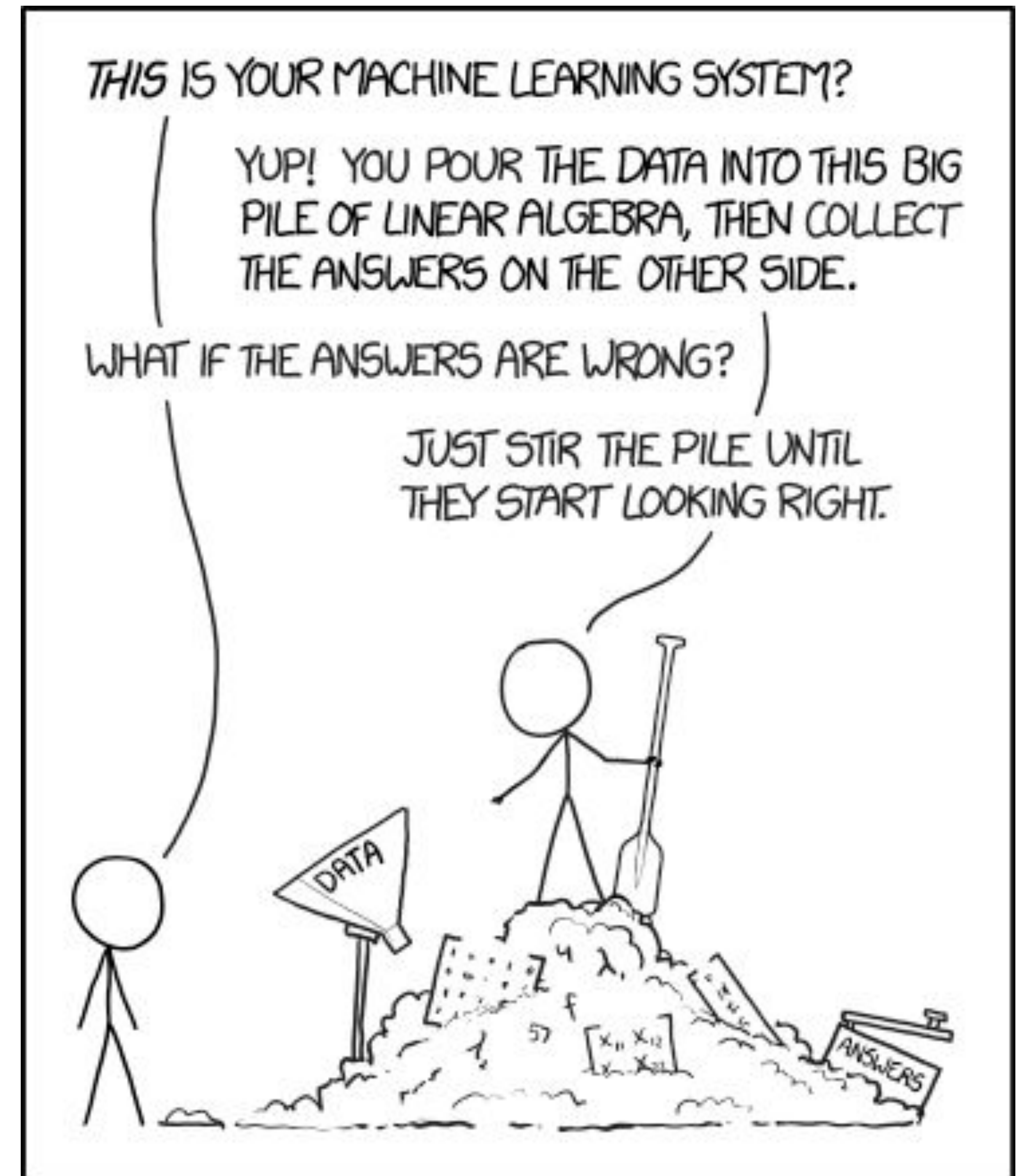
**Machine Learning**

**Deep Learning**
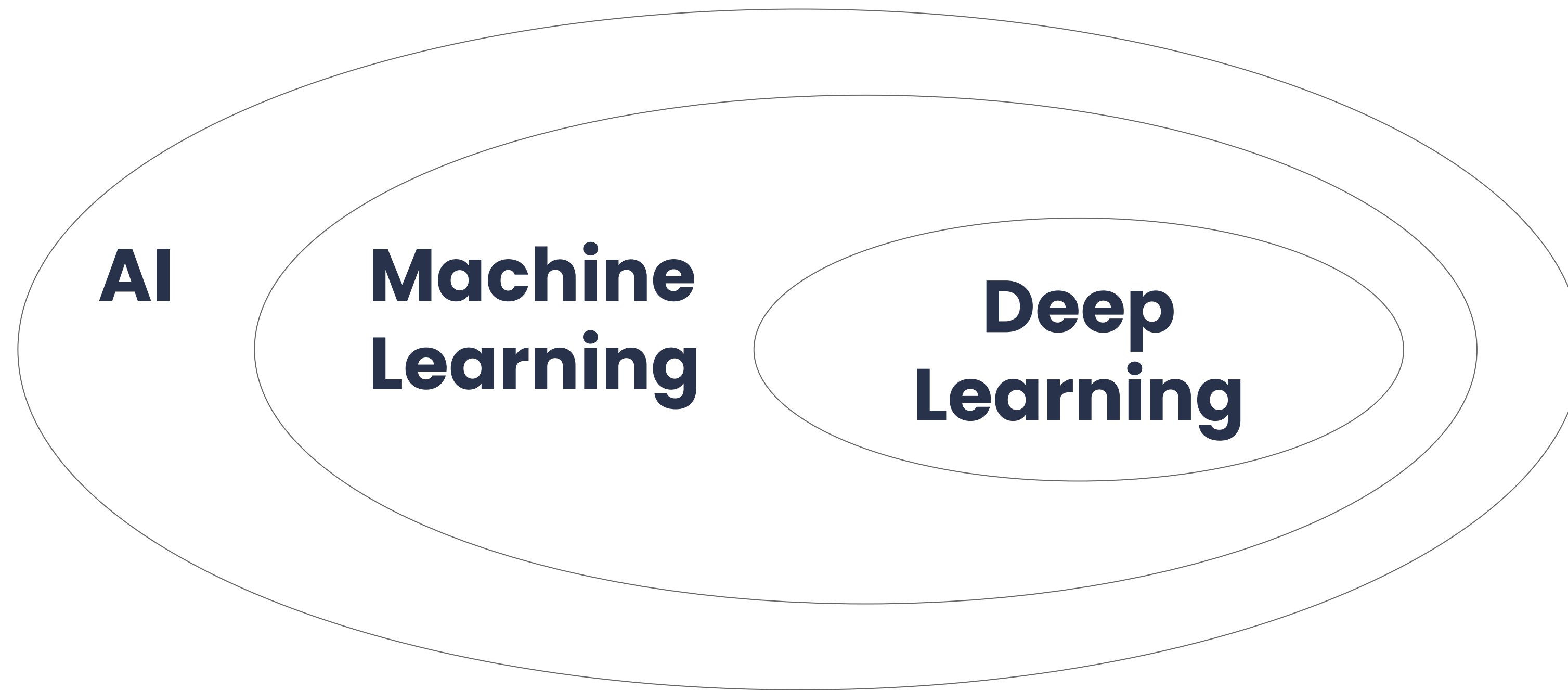
# Definitions

**Artificial Intelligence** - A concept

- Allowing computers to perform tasks that normally require human intelligence

- Eg. seeing, hearing, moving, decision making

**Machine Learning** - A *type* of AI

- A set of methods which can be used to allow computers to perform AI tasks without being explicitly programmed to do so.

# Let's Discuss

Suppose we wanted to predict the price of a dorm room.
How would we go about doing it?

# What is a model?

- "Something" that takes in an input and produces an output

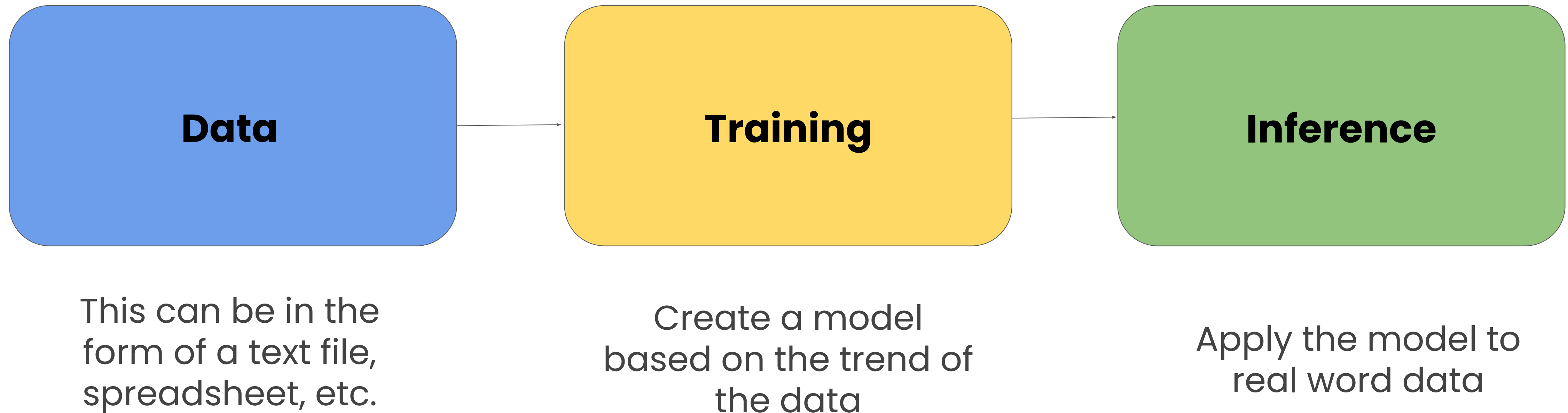  Eg. Takes in a picture and determines whether it is a cat or dog
  Eg. Takes in a sentence and translates it into French

- So it sounds like it would be pretty nice to have a model. Machine Learning helps us create such models through a process called *training*

# Now that we know more about models...

- How would we predict dorm pricing with a model?

- What are some possible inputs for our model?

  - Think about what you would need to tell how expensive a dorm room is

- What would the output of our model look like?

  - Would it be continuous, or would it be categorical ("this or that")?

- How would we go about *training* such a model?

# ML Pipeline

**Data**

**Training**

**Inference**

This can be in the form of a text file, spreadsheet, etc.

Create a model based on the trend of the data

Apply the model to real word data

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# More on the intuition

# How do you know the difference between a cat and a dog?

- Did someone teach you what to look for?
- What specific features distinguish them?
- Every time you got it wrong, your parents told you what animal it was
- Eventually, you learned how to tell the difference
- This is how we will eventually improve our model as well!

# Recognizing Objects in Images: AlexNet

- Trained on millions of photos of different objects
- Learned to **classify** different images by slowly recognizing patterns
- Paper
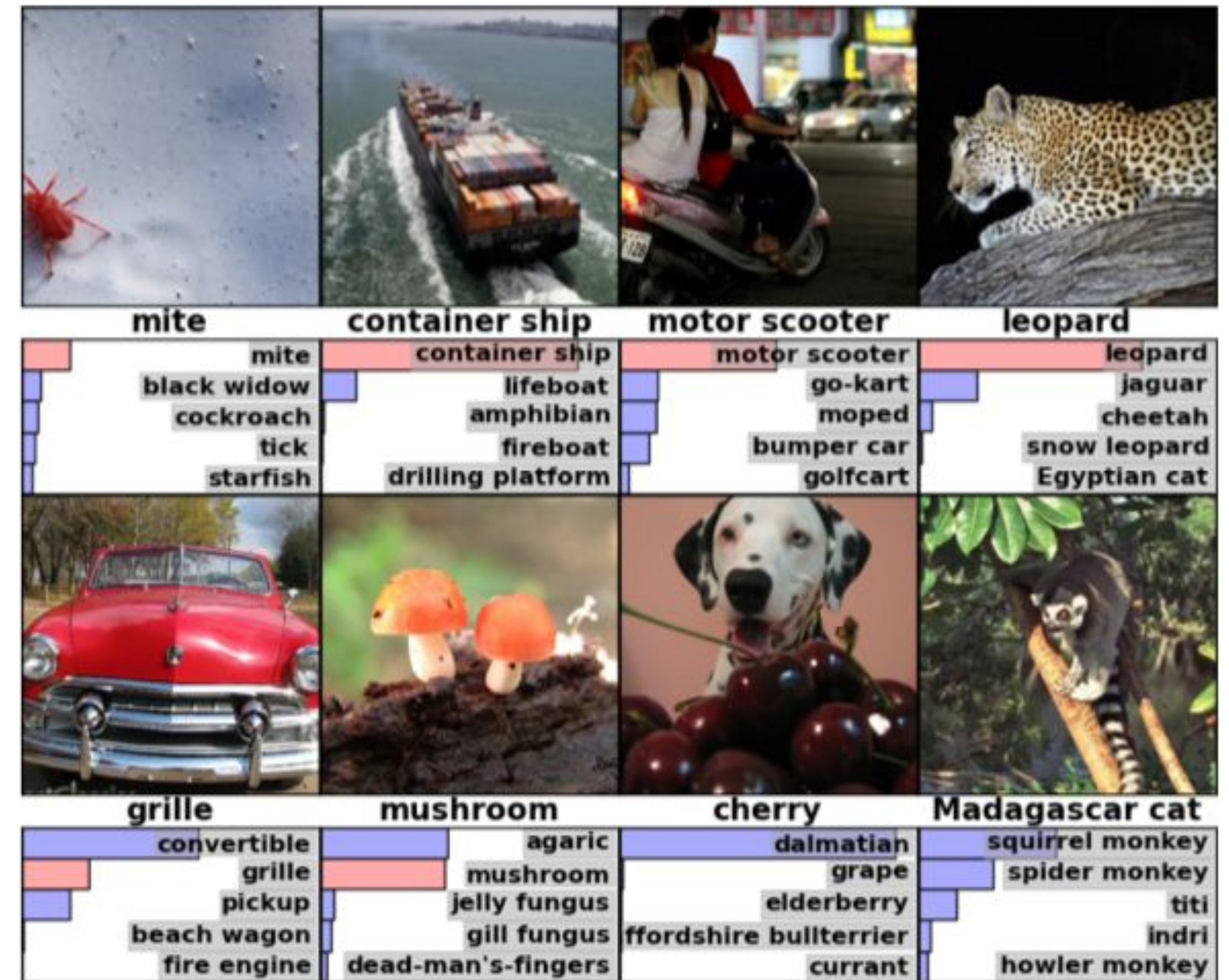
# Python + Environment setup

● We will be using **Google Colab** notebooks, which will come with all the

packages pre-installed.

● The **Anaconda Distribution** is *not required* for this workshop series, but

it's a great tool to work with Jupyter notebooks in general.

# Intro to Python



- We're going to now take a 5 minute break

- The next part of this workshop is going to be a quick introduction to **Python** for those of you who haven't used it before

- If you do feel comfortable with Python already, feel free to leave and come back for our next workshop when we start talking about some ML models!

# Take a break for 5 minutes!

## Link to the Python Tutorial

https://tinyurl.com/btrack-w22-python

# Thank you! We'll see you next week!

Please fill out our feedback form:
bit.ly/btrack-w22-feedback

Next week: The K-Nearest-Neighbours Model

FB group: facebook.com/groups/uclaacmai